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DRAWINGS ATTACHED

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1 249 987

(54) FLUID JACKET

(71) We, J. SAMUEL WHITE & COMPANY LIMITED, a Company registered under the Laws of Great Britain, of Medina Road, West Cowes, Isle of Wight, Hampshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement: —

This invention relates to a fluid jacket for a surface defining a region whose temperature is to be controlled.

Storage tanks, mixing vats, reactors and pressure vessels as used in the processing industries are commonly required to be heated or cooled or held at a constant temperature and in many instances the heating or cooling can be carried out by pumping hot water or oil or cold water or a glycol or alcohol solution through a jacket space formed in the walls of the vessel. The present invention has for one object to provide a cheap and simple method of forming such a fluid jacket. The jacket could equally be used for steam, cool air, combustion gas, and vapour refrigerants.

According to the present invention a fluid jacket on a surface is formed from elongated strip material of channel-like section secured along its edges to the surface and having periodic dimples or indentations between the edges and also in contact with, and preferably secured to the surface. Thus if the strip material is of a metal it can be welded to the surface along the edges and at the dimples. Preferably the channel-like section has a base and sides forming a rather shallow U defining with the surface a passage for the fluid.

The surface will thus usually be the surface of a storage tank or a vat or some other kind of vessel and there may be external insulation over the fluid jacket on the surface.

The jacket has the advantage that it is cheap to manufacture in that it can be of uniform strip which can be wound around the surface and be made to conform to various surface configurations.

Thus a jacket does not have to be preformed to suit the shape of the tank surface and the strip can be made very shallow so as to be comparatively easy to bend around the tank. Of course the strip could be shaped to suit a particular application if desired. The securing of the dimples to the surface as by welding, glueing, riveting or brazing, provides strength to the fluid jacket chamber so that a reasonable width of strip can be used while yet a reasonable pressure of the fluid in the jacket could be withstood without having to have the jacket material of great thickness.

The invention includes a strip material for forming a fluid jacket on a surface, the material having a channel-like section with periodic dimples or indentations between its edges and in which the dimples extend inwardly from the base of the section by the same amount that the edges extend from the base. Thus both edges and dimples will naturally fall against the surface to which they are to be secured.

The invention may be carried into practice in various ways and one embodiment will be briefly described by way of example with reference to the accompanying drawing of which:

Figure 1 shows diagramatically a cylindrical tank having an external jacket formed in accordance with the invention, while

Figure 2 shows a detail of the elongated strip material used for forming the jacket in Figure 1.

Figure 3 shows how successive lengths of strip can be welded together, and

Figures 4 and 5 show how the strip can be applied to the ends of a cylindrical vessel.

The jacket is formed from elongated strip 11 material of very shallow U shaped section with an 8" wide base 12 and sides 13 extending along the edges of the strip from the base towards the surface 14 of the tank by a distance of $\frac{3}{8}$" (Figure 2).

Mid-way between the edges of the strip and on a pitch of 4" along its length are a number of internal dimples 15 which may be perforated and which also extend inwards from the base by $\frac{3}{8}$" to lie against the surface 14 to be jacketed.

The edges 13 of the section are welded to the surface 14 to be jacketed to make the channel leak proof and the ends of the dimples

15 are also welded to the surface as by plug welding so that they provide regular staying of the jacket to the surface of the tank.

This reinforcement by means of the dimples allows the jacket to carry fluid at a reasonable pressure in spite of being of quite thin material and in spite of having a reasonable width.

Having short flanges and being of thin material, the strip 11 is quite easy to bend to conform to the surface to be jacketed. This can be seen from Figure 1 where the jacket is shown in the form of a helically wound strip forming a continuous jacket. Sealing of the ends of the strip and inlet and outlet connections 16 for the fluid can be conventional.

In the example given it will be seen that the jacket surface and the vessel wall surface are stayed to one another at one point for every 4"×4" area of the total jacketed area.

By increasing the number of dimple stays in a regular pattern down the length of the strip jacket so that each dimple plug-weld is subjected to a tensile load not exceeding 2,500 lbs., or a tensile stress not exceeding 7,500 lbs per sq.in. in the weld fillet area, working pressures of up to 250 lbs per sq.in. gauge can be accommodated with 16 s.w.g. steel sheet.

In Figures 4 and 5 the strip is shown forming a jacket on the domed and conical end respectively of a tank. While the strip may be thin enough to be bent for the curved portions, 17 and 18, if it is thick it will be necessary to cut a strip with an appropriate profile out of sheet material and then form the edges and flanges before application to the tank. Also off-set mitred connecting pieces are necessary as shown at 19 and 21, and these will be formed separately and then welded to the curved portions.

The jacket in Figure 4 is a 'double-strip' jacket with two fluid passages interwoven, each with an inlet and outlet connections 16.

Such an arrangement can give better temperature control or the facility of heating and cooling alternatively with different fluids.

Other 'multi-strip' arrangements are possible.

Figure 3 shows how successive lengths of strip whether in line with, or at an angle to, one another, can be joined together by butt welding using a backing strip 20.

WHAT WE CLAIM IS:—

1. A fluid jacket on a surface, the jacket being formed from elongated strip material of channel-like section secured along its edges to the surface and having periodic dimples or indentations between the edges in contact with the surface.

2. A jacket as claimed in Claim 1 in which the dimples are also secured to the surface.

3. A jacket as claimed in Claim 1 or Claim 2 in which the channel-like section has a base and sides forming a shallow U defining with the surface a fluid passage.

4. A jacket as claimed in any of the preceding claims covered by external insulation.

5. A jacket as claimed in any of the preceding claims in which the strip material is angled, deformed, or curved rather than extending linearly.

6. A jacket as claimed in any of the preceding claims, including connections for leading fluid to or from the space within the channel-like section.

7. A jacket as claimed in Claim 6 in which the strip material provides a continuous defined flow path for fluid from the inlet to the outlet.

8. A jacket as claimed in Claim 6 in which the strip material provides two or more separated fluid paths each from an inlet to an outlet.

9. A fluid jacket on a surface arranged substantially as herein specifically described with reference to Figures 1 and 2 or 4 or 5 of the accompanying drawings.

10. Strip material for forming a fluid jacket on a surface, the material having a channel-like section with periodic dimples or indentations between its edges, and in which the dimples extend inwardly from the base of the section by the same amount that the edges extend from the base.

11. Strip material as claimed in Claim 10 in which at least some of the dimples are perforated to provide an edge for welding to the surface.

12. Strip material for forming a fluid jacket on a surface constructed and arranged substantially as herein specifically described with reference to Figure 2 of the accompanying drawings.

KILBURN & STRODE,
Chartered Patent Agents,
Agents for the Applicants.

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1249987 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

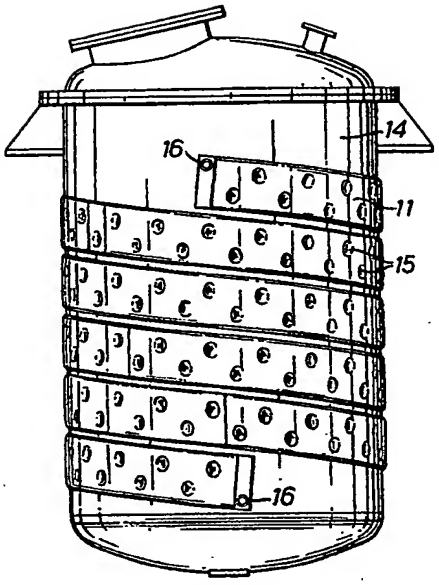

FIG.1.

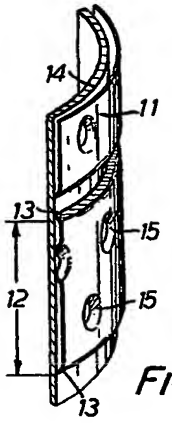

FIG.2.

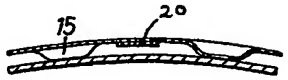

FIG.3.

1249987 COMPLETE SPECIFICATION
2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 2

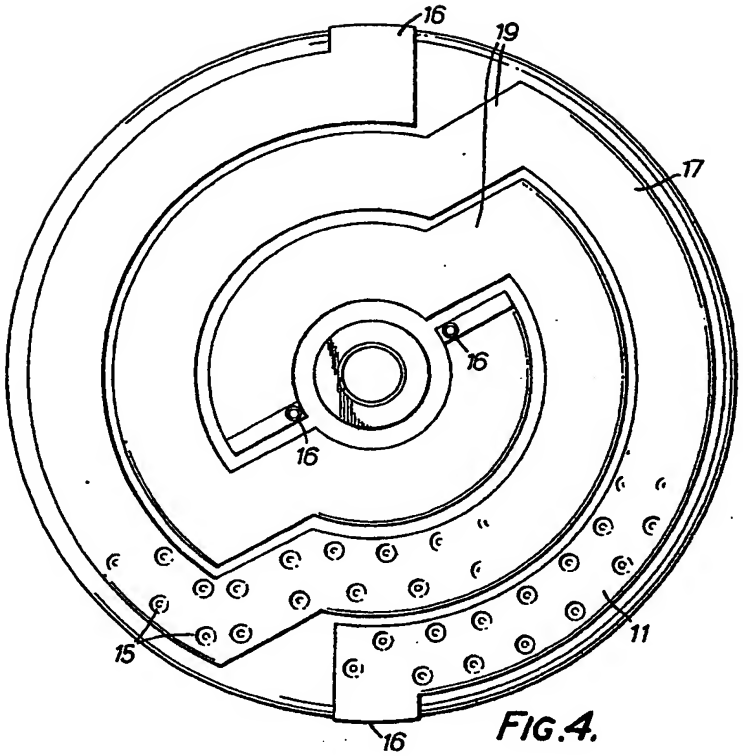

FIG. 4.

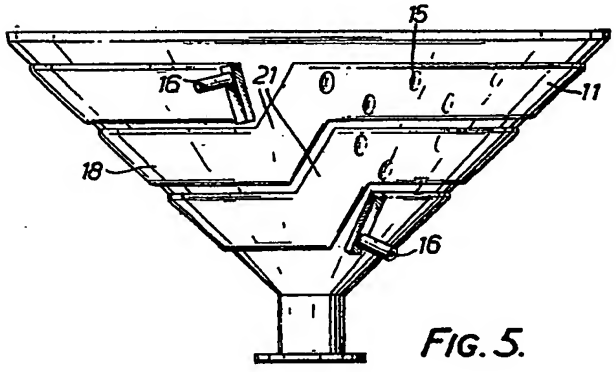

FIG. 5.